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KNOTTING MATTERS

The Magazine of the International Guild of Knot Tyers

INTERNATIONAL GUILD OF KNOT TYERS

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KNOTTING MATTERS

THE MAGAZINE OF THE
INTERNATIONAL GUILD OF KNOT TYERS

EDITORIAL BOARD
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The editors welcome the submission of letters, articles, photographs and sketches for publication. Correspondence with the editors may be by e-mail, but more extensive items, such as articles for publication, as well as any pictures, need to be sent as attachments. Pictures should be of good quality. All submissions must include their author's name and e-mail or postal address.

If there are meetings or other events to be publicised in *Knotting Matters*, please bear in mind the months of publication - March, June, September and December. Although the deadline for the next issue is always given at the foot of the Index page, please note that the editors begin putting it together at least three weeks earlier.

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PLEASE NOTE: LETTERS AND ARTICLES FOR THE JUNE ISSUE OF KNOTTING MATTERS MUST BE RECEIVED BY 12th MAY.

FRONT COVER: A tactile sculpture (diameter 4ft 6in) in the village of Luddendenfoot, West Yorkshire, beside the Rochdale Canal. Photographed by Gordon Alexander.

EDITORIAL

One of the questions that is exercising the Editorial Team's brains is what our members expect or hope to see in *KM*. Between the copy we have received and some of our own particular interests, we have so far managed to populate the pages of *KM*, but are there other areas of knotting that you would like us to try to cover?

Following our first foray into trying to improve the *Knotting Matters* experience by using the IGKT website for some additional extras we have finalised the following three elements:

Authors' Biographies: Authors of *KM* articles are now being invited by the editors to submit a brief biography for inclusion next to their article in *KM*, which will also appear in this section. **Supplements:** The editors will select further articles allied or related to an article in the current *KM*, but which are not expected to be published in *KM*, to go on the website – and remain there until the publication of the next print edition of *KM*. **'Stop Press':** Time-limited announcements which have been received too late for publication in the current issue of *KM* will be published in this section and remain in place until the next issue or the date of the item.

You will notice that there is a bit of a theme to this quarter's offering, namely knots in nature. This was not something that we had planned just good old serendipity.

Between now and the Summer edition we will of course have had the Spring meeting and AGM in South Molton where we will have the chance to check, with those of you who are coming, what more we could do to keep *KM* interesting and stimulating. For those of you who will not be there, we invite you, yet again, to pick up your pen or switch on the computer and get in touch.

Having persuaded other authors to publish a short bio, we, The Team, have bitten the bullet and are including ours as well.

Exciting news about the upcoming Ashley Exhibition!

Maurice

LETTERS TO THE EDITOR

Dear Maurice

The recent correspondence in *Knotting Matters* about tying one's shoelaces has reminded me of an early achievement. I was very proud of the fact that as a Brownie (many years ago!) I was consistently the fastest in the Pack at tying my shoelaces with a reef bow, standing on one leg and with my eyes shut. These days I'm not sure that Health and Safety would approve of the Guild using this as a regular Challenge at some of our meetings.

Was this my first encounter with the importance of knots and string? I don't think so. In the frugal post-war years when parcels arrived wrapped in brown paper and tied up with string, I was made aware that one of the worst sins I could commit was to use scissors. I became very adept at undoing all the knots, untangling the string and hanking it neatly before being allowed to delve in and see what exciting presents I had been sent for birthday or Christmas.

Penny Bodger

oOo

Dear Maurice,

Standing about, recently, in a small back-street garage, I spotted a piece of 'Octoplait' rope which I photographed. The quality is evident from the pictures, notice the dogging of the strands at the end of the splice, not only that, but the splice is not that commonly seen or done correctly. The rope is made up of four opposing pairs, resulting in a very pleasing square cross-section.

Most people would just cut the strands and melt them in, so it was nice to find a textbook example in such unlikely circumstances. It wouldn't have seemed so unusual in what you might call a more appropriate setting or environment.

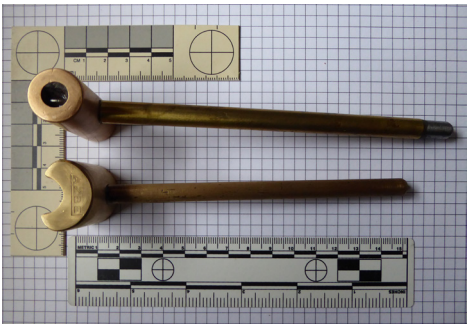
I was just so surprised to find them in a place where frayed oily bits of tatty rope are the norm. Curiosity aroused, I managed to track down the splicer: ex-Merchant Navy, and he'd never heard of the IGKT. Well he has now! (Shoe included for scale.)

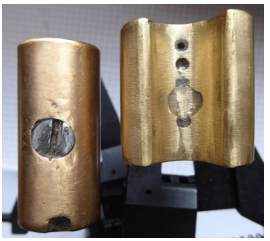
Regards,
W. Kerr

oOo

Dear Maurice,

By coincidence, the day before *KM* arrived with an article by Des Pawson on serving tools I had just completed making a small serving tool from a cannibalised lock body and a heaving mallet from a brass gas pipe fitting. I made them because the tools I had at my disposal were just a little too large for a job I was doing. They have worked perfectly and now I am wondering what other tools I can make for myself.





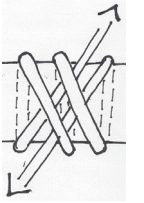
I had already made a sailmaker's stich heaver from a large Allen key, a couple of steel tubular heavers with slots (see *KM* 131), fids from antler and am looking for a suitable leg bone to convert into a primitive Swedish fid.
Richard Hopkins

oOo

Dear Maurice,

Cazbil's article on beachcombing finds (*KM* 130) prompted me to dig out a bit of old rope I found washed up on a (very) remote beach in Northern New South Wales some time ago. I have no real idea of its purpose and am hoping members can offer suggestions. Whatever its use it has some interesting knot work.

The crossing knot at the right (internal diameter 30mm) has three turns (see sketch) and I would call it a three-turn Clove Hitch (can't find it described in Ashley). The hitch is locked with a two strand Wall Knot (*ABOK* #237) and the two ends are joined with a cut splice (*ABOK* #2832) to form a closed loop.



My guess is it was probably used to attach a float to a long-line of some kind. While trying to reverse engineer the construct to understand its use, it became obvious that, since the whole is a closed loop, the cut splice had to be added after the hitch and wall knot were in place. So, my questions I hope someone out there can help me with are: why go to so much trouble? Wouldn't it be a lot easier to have a pre-prepared closed loop and simply attach when/where required with a Cow Hitch/Ring Hitch/Prusik Knot or similar?

Jim Caswell

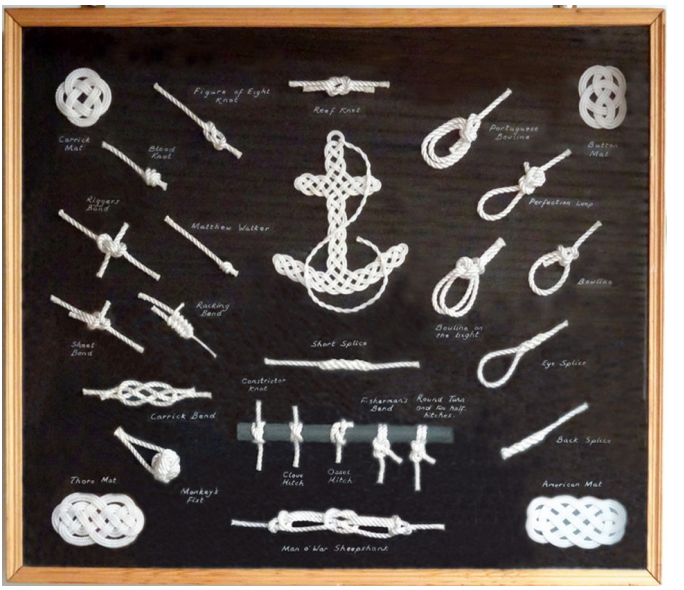
oOo

Dear Maurice

In spring 2016, a visit from an Australian friend, a keen birdwatcher, gave us an opportunity to explore parts of Scotland we hadn't been to before. After a few days on Islay, we hoped that the Great Glen might give us a sighting of a golden eagle.

However a visit to the Eagle Barge Inn, a converted Dutch barge floating in the Caledonian Canal near Laggan Locks, yielded a pleasant surprise.

The interior houses all manner of interesting artefacts on display and not surprisingly our attention was caught by a knotboard.



Closer inspection revealed that it had been done by Brian Field, Guild President from 1999 to 2002, and there was a photograph and acknowledgement nearby. The managers of the Inn, Will and Vic, were delighted to hear that we too had had the privilege of knowing Brian.

So if you have the excuse to travel in Scotland and find yourself near Invergarry, call in and pay your respects to Brian. The food's good too!

Penny Bodger

oOo

Dear Maurice,

Knots shape the universe

According to a theory discussed in *New Scientist* 5 September 2015 the Universe owes its shape to knots. Knots are also the reason that the Universe is three dimensional. Immediately after the Big Bang the universe is thought to have expanded rapidly in a process called inflation.

The early cosmos was filled with things resembling gluons – the force carriers that stick quarks together to form protons and neutrons. As the universe cooled stringy objects called flux tubes formed between the particles.

The tubes were so densely packed that they became knotted in the same way that bits of string put in a box become knotted. Knots can only exist in three dimensions. Any more and the loops can pass through the extra dimensions and become untangled.

Arjun Berera at the University of Edinburgh, and his colleagues, have come up with a theory to explain the flux tubes and the 3D universe but the theory still has to be tested.

In the meantime – Isn't science wonderful?

Richard Hopkins

(And see the article by Colin Byfleet on p 17 - Editor)

oOo

Dear Maurice,

Ref. 'Lassos: the secret revealed' in *KM* 132 (September 2016), Cazbil might be interested in *Will Rogers Rope Tricks* by Frank Dean, published by *The Western Horseman* in 1969 (copies can still be obtained via the internet). This describes the rope recommended for beginners as a hard, tightly woven, braided cotton known as 'Samson Spot Cord' #12 size (3/8in diameter), approximately 15ft long.

The illustrations to Cazbil's article show a three-strand nylon/poly blend rope, but the professional roper's favourite is four-strand maguey rope, handmade in Mexico from a native plant, *Agave americana*, which is stretched to take out any kinks in the coil by exposure to the sun.

A loop, or 'honda', is formed at one end by threading the rope through itself, then unlaying the strands and forming a Turks Head knot. The 'stitched leather piece' is to reduce wear as the rope spins, but it also slows down the slipping of the rope – a decided advantage for the learner – and useful to the professional in performing some of the more difficult tricks. This wear leather or 'burner' is sometimes replaced with a brass one, as the weight of the honda affects the centrifugal force responsible for control of the rope.

The above publication contains many line drawings, as well as stills from the 1925 silent film, *The Roping Fool*, showing the rope-spinning skills of Will Rogers. Perhaps of particular interest to IGKT members are the illustrations showing overhand, slip, double bow, figure of eight, wedding or true lovers' knots and half hitches, all obtained by spinning the rope(s).

Perhaps some of the Mexican, American, or Canadian IGKT members are as adept at rope spinning as they are at knotting.

Regards

Dave Hesketh.

oOo

Dear Maurice,

On the matter of lassos: The standard thickness of ropes is 3/8in (9.525mm) called 3/8in true; other variants are 3/8in scant and 3/8in full. The length of the rope for catching the head (heading) is 30-33ft (9.15-10m), while for roping the hind legs (heeling) it is 35-36ft (10.66-11m). The ropes for heading are softer than those for heeling.

Laplanders make a lasso with leather strips. To use their lasso, they open the lasso into one large loop which they then coil to a manageable size, and they then throw the coils to catch the reindeer's horns.

Argentinian gauchos also use a lasso made of leather strips as well as the bolas Their lasso is small: 5/16in (7.937mm), length 7ft (2.10m) and is used for tying the calves' legs, once they have been brought down, by putting the loop on the fore leg and then joining the rear legs. They can do this in about 15-20 seconds.

Some etymology and other notes on the subject:

cowboy - synonyms are: cowpuncher, cowhand, cowpoke, buckaroo (from the Spanish *vaquero*);

dally up - from the Spanish *dar la vuelta* - dally vuelta -later only dally;
grass rope - made with hemp;

gut line - made with leather or gut;

lariat - (from the Spanish *la reata*)

lasso, lasso(e)s, lazo, lariat, gut line, maguey, rope, seago - from the Spanish *lazo,* and the Italian *laccio*, *lacciatora*);

maguey - made from agave, sisal;

seago - from the Spanish *la soga*, and the Italian *sagola* or *soga*.

Size	Stiffness (lay)	Length	Use
3/8in	SS super soft	30-32ft	Heading
3/8in	XXS-XX soft	30-32ft	Heading
3/8in	XS	30-32ft	Heading
3/8in	S - soft	30-32ft	Heading
3/8in	S - soft	35-36ft	Novice - Heeling
3/8in	MS	35-36ft	Heeling
3/8in	M	35-36ft	Heeling
3/8in	MH	35-36ft	Heeling
3/8in	HM	35-36ft	Heeling
3/8in	Hard	35-36ft	Heeling
7/16in (scant or full)		35-36ft	Heeling
5/16in		7ft	Piggin'string

Gino Pietrollini

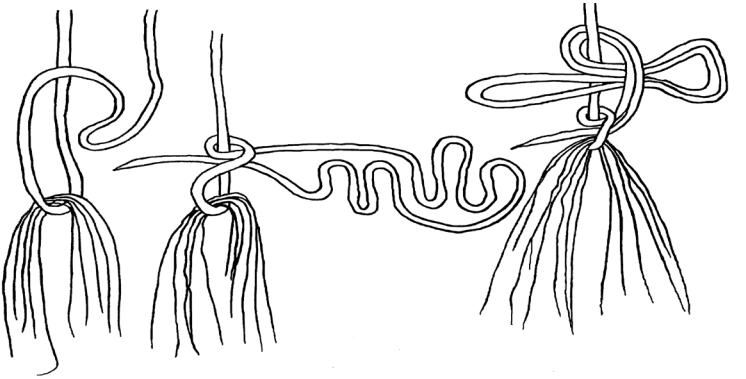
oOo

Dear Sir,

You recently had an article on knots that were easy to undo. I submit this as another one.

I am a braid weaver, and need a knot on the cord from the rollers of my loom to the bundle of threads I am going to weave, and this needs untying and retying quite often, and usually with just one hand. When the warp is under tension during weaving, the knot tightens considerably.

This is basically two half hitches, but with the ends doubled. Start with a good long end.

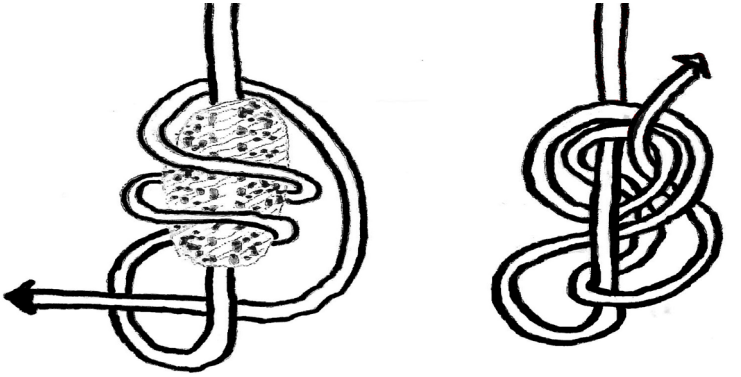


1. Make the first half hitch normally, but only pull the cord through till a short bit of the cord is left behind. Pull this tight down onto the bundle of warps.

2. Use this long loop to tie the second half hitch, only pulling through till a loop remains. Pull down tight onto the other knot. To undo, first pull the single loop of the second hitch, then the end of the cord.

This next is a useful knot I have just learnt, which saves wastage: The Forester's knot. To tie a bundle of bean sticks or the like.

1. Take the short end under the bundle, and come up to the right of the one from the ball, and hold it between the thumb and forefinger. Wind the short end twice round the thumb and long end. Go between the ball thread and the bundle from right to left.



2. Pull the end through with your thumb as you withdraw it.

Pull the knot tight, using the long end, after sliding it down against the bundle. Pull hard on the short end to upset the knot, and, if you wish, tie a reef knot.

Anne Dyer

Dear Maurice,

I think it was the famous, inspirational Hanoi-born French single-handed yachtsman Bernard Moitessier who said, “Life is too short to splice wire rope”. Unless you are one of life’s gifted wire rope splicers like John Barber, who once spent a long time in an icy wind showing me how to do it properly, he was probably right.

On the other hand, you could read that incredibly informative and useful tome *Riggers Apprentice* by Brion Toss, in which he describes what he calls a ‘Molly Hogan’ wire splice. You can do it with your hands without tools. I’ve done it, and tested it using 8mm wire rope, one stout tree, 30ft of nylon rope to generate a reasonable amount of stored energy and a 3-ton Land Rover; none of the foregoing were hurt in the exercise, not even the operator.

Unless you live in Milton Keynes, Notting Hill, Manhattan or Downtown LA, I don’t know about Queens or Jersey City, you should find it reasonably easy to nip out and buy a length of wire rope.

As you would with any other rope, put on a constrictor at some distance from the end, split the rope in half, without getting too finicky about what constitutes half because you will most likely find there is an odd number of strands! Just do your best. Tie a half knot with the two pieces: you will instantly discover whether you should do right-over-left or left-over-right, continue to fill the empty grooves in each part. When you get to the divide, either twist the remainder together or twist round the standing part, and tidy up as required.

The main thing is to jump in your wheels, go get a piece and have a play, but the most important thing of all, by a very long way, even if you make a pig’s (hog’s) ear of it, let the world know how you got on. For all you know there is some bored person stuck in a hut on the Antarctic Survey who will be really interested. And the best way of doing that is in a note to *Knotting Matters*.

N. King

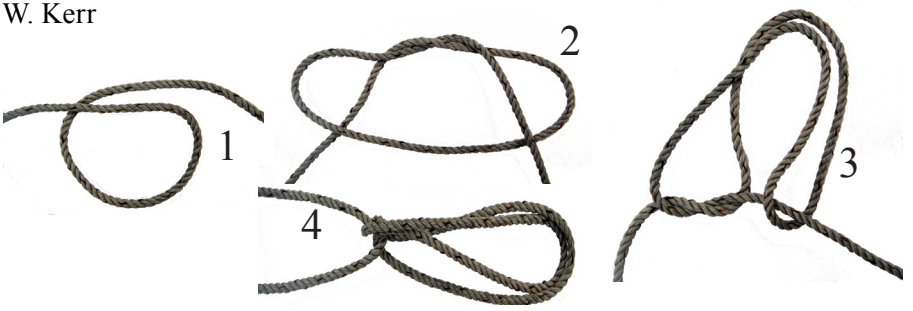
oOo

Dear Maurice,

Wait long enough and everyone gets a chance to shine. I was asked once to load a heavy piece of equipment into a panel-van with a fork-lift truck, to get it tested for electro-magnetic radiation. Arriving late in the middle of nowhere as these test sites often are, I found no fork-lift and no rope, only a sling and an engine lifter – a wheeled device comprising a long arm with hook on the end, which hit the van roof before even starting to lift the machine using the sling. Brainwave! the sling shortener! (*Handbook of Seaman’s Ropework* by Sam Svensson 1971 Adlard Coles)

This is now frowned upon, I believe, by insurance bodies, and those who teach slinging and rigging, but I can't think why. If someone can explain it please do so. This 'knot', what would you call it? It cannot jam, it's easy to tie and falls apart after use. I've never known it to slip or damage the sling, and it's infinitely adjustable to boot. Just follow the pics.

W. Kerr



Dear Maurice,

In reply to N King's queries re political correctness, firstly, the Granny Knot is in fact not an insult to the distaff side of my generation, it first appeared in a book on gardening published in 1627, and refers to a knot that a poor old lady with fingers crippled with rheumatism might tie.

As to 'PC', isn't all that rather passé now? It was taken to ridiculous lengths years ago, eg should there be a Mother Xmas? Forget it! And as to what he calls 'the Anglo-Saxon term for the groove of stranded rope', N King has obviously not read any of Lord Rochester's poems. In the 17th century it was an adjective as well as a noun. It merely meant a groove and was an acceptable word. It was the puritanical Victorians who made it obscene. Remember, it was they who made macramé skirts to hide the naked legs of pianos. And the gender question? For pity's sake!

Gorillas tie square knots. In Cyrus Day's book (1937), he quotes an anthropologist: 'gorillas use them to hold creepers and saplings together to make their nests'. He once counted two dozen in one nest, most were grannies, but three were square knots. While on the subject of knots in nature, BBC's natural history archive has a film of an African Weaver bird building a nest. They build cocoon-like structures hanging from thin boughs, to prevent snakes taking the young. To start his nest, he hung upside down under the bough with one claw, and with the other and his beak he tied the perfect clove hitch! I first wrote the last two items about 20 years ago in *KM* #54. So, N King, does that qualify to be entitled *ABOK* #2896?

Roger Carter (New Zealand)

GT DP MMcP

The Editors

So that readers can aim their brickbats more accurately, the editors have decided to introduce themselves.

Maurice McPartlan

My knotting began with a fortuitous present of a book of knots: *Brown's Knots and Splices* because of which I became the only cub to know how to tie a Turks Head. *ABOK* was my twenty-first birthday present and has travelled round the world with me. I have always been interested in THs but recently have been doing more plaiting – I am a member of the Australian Plaiters and Whipmakers Association – and have been entering plaiting competitions with some success.

Gordon Teenan

Like many others, it began with Baden-Powell's brigade, lashings and woggles. Faded for a while, but surfaced with burgeoning interest in square-riggers. Attending the start of the Tall Ships Race in the 80s at Cowes, saw a card in The Commodores House (once owned by Uffa Fox who taught the Royal Family to sail) on an exhibit labelled 'International Guild of Knot Tyers'. Took a very long time to find a contact but finally managed it after talking to someone in the National Maritime Museum. The extent of the field amazed me with the discovery of *ABOK*. Main interest was the practical side, one inch manilla with the evocative aroma of Stockholm tar and avoided the rest, but realised there was room for the 'fancy stuff' as made with great skill by many clever members. Learned a few to expand my horizon, plus a couple of tricks to amuse the little ones. Knotting continues to hold my attention and interest after all this time, and I still struggle not to bore the uninitiated.

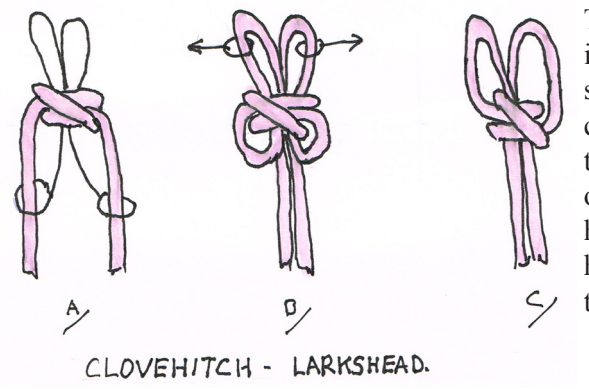
David Pepper

Having learnt his basic knots, splices and lashings as a Cub and Scout, David continued to expand his repertoire and apply his knowledge in practical ways throughout his life as a large animal veterinary surgeon, often consulting his *ABOK*. His interest has always been in what Ashley calls 'occupational knots'. While ever keen to imbue others - his wife, children, veterinary colleagues and anyone who he can trap in a corner – with his enthusiasm for a useful or appropriate knot, he usually fails, but intends to continue undeterred.

Puzzle Knots - The solutions

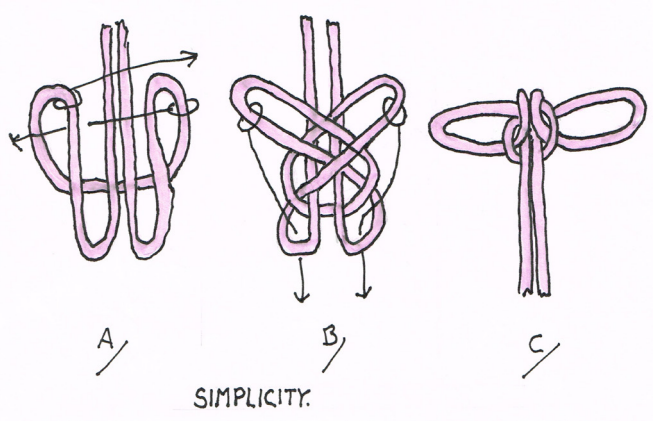
by Owen Nuttall

There are two easy ways of tying the clove hitch - larks head. The first: after B, pull the two loops in opposite directions, straighten the clove hitch, adjust the two legs so that they are uncrossed and parallel, then tighten the clove hitch. To make the two loops smaller, pull down on the two legs to make this simple decorative knot.



The second: at B, gently pull in the two loops so they are snug at the bottom of the clove hitch, then hold the two loops with your thumb on one hand, with your other hand gently roll the clove hitch down, then adjust as the first method.

For Simplicity, after threading the two loops through the bottom loops as in B, hold them with one hand and with your other hand gently pull down on the two legs to bunch up the centre of the knot. Then gently pull the two loops in opposite directions.



Adjust the two loops by uncrossing them and make sure that they are parallel. The two loops can be made smaller by pulling the bottom leg of the loop and working it down with the same side leg.

Knots That Moray Eels Tie

by Hamish Malcolm

People are not the only tyers and users of knots. A variety of elongated cylindrical-shaped animals with backbones also tie knots. This includes some but not all species of snakes, seasnakes, hagfishes, and eels. They tie knots in their own bodies for a variety of uses. These include predation strategies such as manipulating or crushing prey, helping tear flesh off prey, and helping to extract prey from hard to reach places. Other uses include self-cleaning, skin shedding (in pelagic seasnakes), and avoiding being eaten. Some of these species were probably using knots long before people.

Without ropes and knots humankind probably wouldn't have advanced to where we are today. Horses may have remained unridden, fields unploughed, ships un-sailed, ancient civilisations not built. Like people, the ability to tie knots has probably contributed to the success of these cylindrical knot-tying vertebrates. Hagfishes (jawless fishes) are part of the oldest-living group of fishes with a range of strategies that have kept them successful over hundreds of millions of years. This includes the ability to exude a thick slime when predators try to eat them, so that the predator gets a mouth full of slime and spits them out.

The down-side of this strategy is that their own breathing pores become blocked by slime. It's a bit of a problem if you don't get eaten but suffocate instead. However, tying an overhand knot in their body helps them to scrape off the slime once it isn't needed (1, 2). Hagfish are scavengers and eat a lot of dead stuff. They have sharp teeth positioned on their tongue but don't have jaws to bite off flesh. Therefore knotting helps them to tear off flesh. This works by them pulling their head back through the knot to provide leverage (1). It also helps them extract live prey from burrows (2). This leveraging strategy is also used by eels. In particular, moray eels are knot tyers. At least 11 types of moray eels are known to tie knots (3,4,5,6,7,8) including overhand knots, double overhand knots and figure-of-eight knots. The working end is their tail, which ties the knot, with the standing end being their head.

Moray eels are successful predators and scavengers in narrow spaces in reefs such as cracks and holes. This success can be attributed to the combination of a long narrow body, slimy skin, a raptorial second jaw, ability to rotate, and knot tying.

Green morays (*Gymnothorax prasinus*), the ultimate contortionists, have now been observed tying at least five types of stopper knot (8). This includes the three already mentioned but also two previously unnamed (9, Des Pawson personal communication) and now recently described knots (8), which are variations on the figure-of-eight and banana knots. These are now called the 'moray knot' (fig. 1) and the 'moray banana knot' (fig.2) as shown below.

These two knots have only been observed a few times in green morays so they are not commonly used, unlike overhand knots. Green morays use overhand knots the most and some moray species only tie this knot. When needing a more robust knot with greater leverage, green morays tie figure-of-eight knots more commonly than double overhand knots. This is probably because this knot is wider, yet with fewer crossings making it easier for the eel to move the knot up its body, while generating greater leverage.

People are definitely the masters of knots, but we are by no means the only knot tyers. Nature still has many secrets to share and there may be other knots used by animals and plants.

Thanks to Des Pawson for knot advice and encouragement.

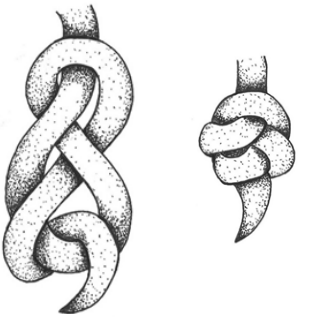


Figure 1. Moray knot: loose configuration and tightened

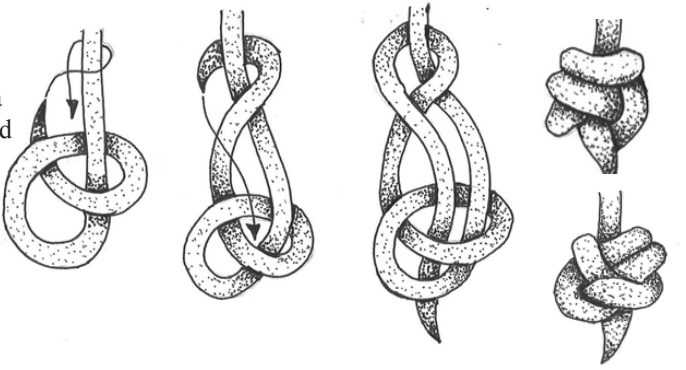


Figure 2. Moray banana knot: tying sequence and tightened

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Hamish Malcolm

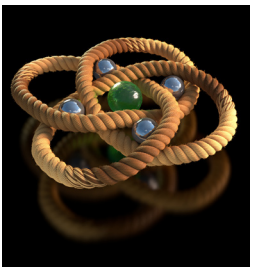
Hello IGKTyers. I'm a New Zealander-Australian who uses knots in rock climbing and as a marine scientist spending a lot of time on boats. I've had a long-term interest in knots from sailing and working in various commercial fisheries. I've become interested in the knots that eels tie, as an aside to my main research on fishes. Researching eel knots is how I came across the IGKT and Des Pawson. I also love the aesthetics and utility of intricate decorative knots and wish I had the patience and skill to tie them myself, not having progressed much past Turks Heads and Monkey's Fists. My hat is off to all you amazing knot tyers and the incredible knot work show-cased in *Knotting Matters*!

MOLECULAR KNOTS

By Colin Byfleet

Close relation to Guild's logo knot (4B,3L TH) makes news in the journal Science

Just over a year ago in *KM* 130 there were photographs of some knots in graphene oxide which were about 0.1mm across. In a recent issue of the magazine *Science* there is a paper[1] from Professor David Leigh's group at the University of Manchester, UK, which announces a new *molecular* knot.



In this beautiful rendition in Figure 1 (right) of the shape of the knot, you can see that it is a single pass, three-lead, four-bight Turks Head (the basis of our IGKT logo). The difference here is that the tucking is over-over, under-under, rather than the normal alternating pattern. In topological jargon, this is knot 8-19 (8crossings, no 19 in Rolfsen's list): the IGKT logo is 8-18[2]. The spheres in the image represent atoms which are removed in the final step of the synthesis.

Figure 2 (right) shows a three-pass version of the 8-19 knot, tied on a cylindrical former. It looks like a mixture of a normal 3-stand plait and two strands twisted together. Because of the o,o-u,u pattern, it is not very stable until tightened, like quite a number of non-standard Turks Head arrangements.

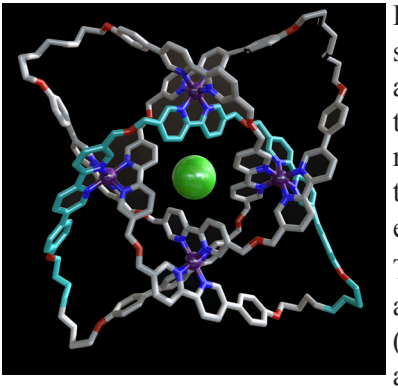


Figure 3 (left) shows the structure of the strands of atoms. In these images, atoms are at the bends of the strand, the links between them represent chemical bonds. The 8-19 molecular knot is claimed to be the tightest (in the sense of having the smallest radius loops) ever made.

The length of the 'rope' (a chain of carbon and oxygen atoms) is about 20 nanometres (one nanometre is a millionth of a millimetre) and since there are 8 crossings, each of these occurs in about 2.5nm and is made of just 24 atoms. There is a lovely animation of this molecule at:

http://www.catenane.net/media/2017_Knot_819_molecule_flyaround.mp4

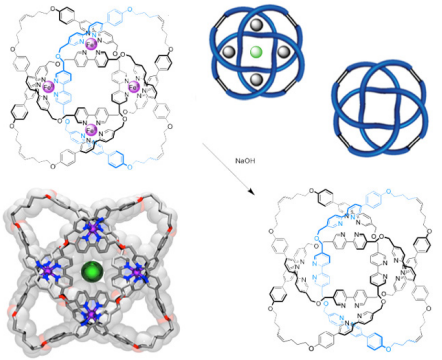
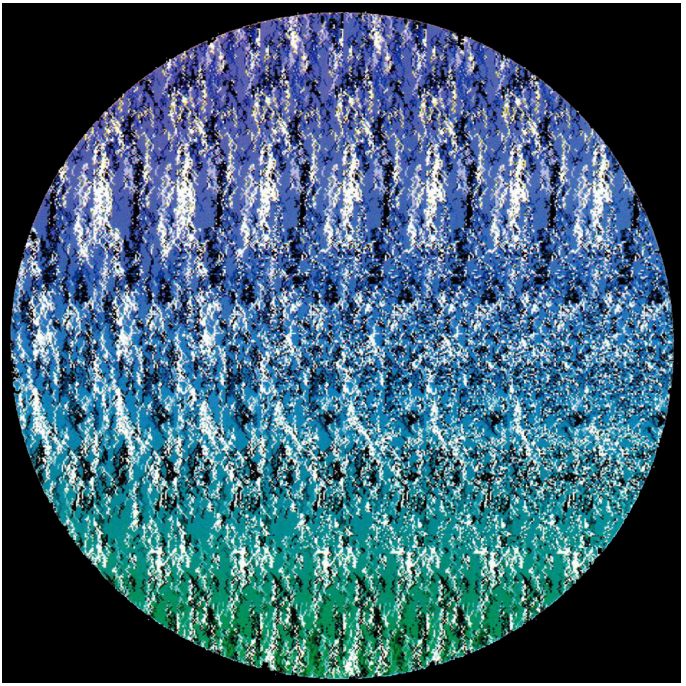


Figure 4 (left) shows diagrams of the removal of the iron and chlorine atoms to leave a completely organic knot. Because, like string, chains of atoms are flexible, removing these atoms enables the knot to flop around and so a 3D picture is not so easy to visualise. If you trace the strand around, the blue and black shading shows the 'over-over' part of the crossings.

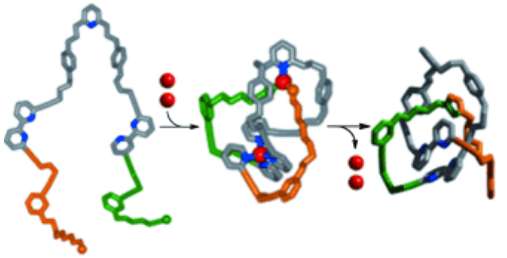
Molecular knots have been seen in DNA strands, in proteins and in polymers like nylon. It is useful to find how to create such knots both because it increases our understanding of biochemistry and because it could well lead to the production of new and useful materials.

Leigh's co-workers have, for some years, been making a family of molecules with loops and interlocked crossings called catenanes (from the Latin *catena*, a chain, which gives rise to our catenary for supporting cables).

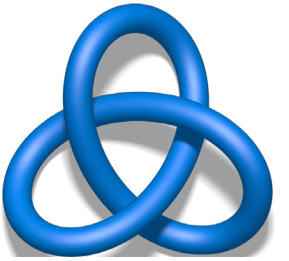
One of these chains, with just two links, was shown as a 'magic eye' picture on the cover of the journal *Angewandte Chemie,* Vol 34 No11 in 1995, shown in Figure 5 (right). It took me a while to see it, but there is an image of a molecule in this seemingly random pattern. To visualise the 3-D image stare at the page from about 30-40cm away and try to focus on your reflection which will be the same distance behind the page.



As with all optical illusions, it takes some time for your brain to be persuaded.

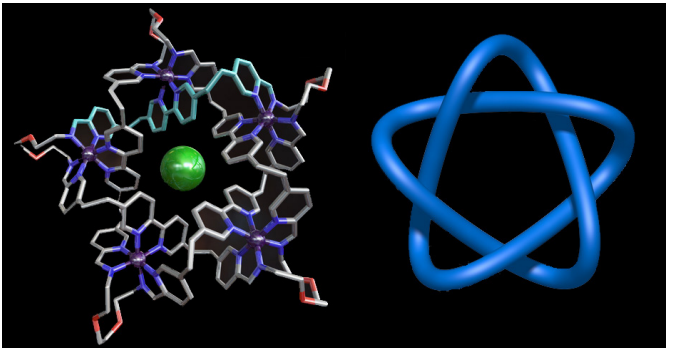


As we have seen, many of the Leigh group molecules are more complex than simple chains: they are real knots (Figure 6, left).



One of the first was a synthetic trefoil knot, made in 2011 and announced then as the 'smallest knot ever tied'. The trefoil (opposite) was followed by a more complex cinquefoil (Figure 7, below)a year later[3].

These knots are the simplest two-lead Turks Heads. Trefoil 3B, 2L, cinquefoil 5B, 2L.



Interestingly the cinquefoil, flattened, appears on both Moroccan and Ethiopian flags as a pentagram – the Seal of Solomon.

Acknowledgements: *KM* is grateful to the following for permission to use the illustrations.
Figures 1 & 3 Stuart Jantzen www.biocinematics.com
Figure 7 Robert W McGregor www.mcgregorfineart.com
Figures 4,5,6 Professor David Leigh, University of Manchester

[1] 'Braiding a molecular knot with eight crossings' Jonathan J. Danon et al, Science, 355, 159-162 (2017).
[2] See, for example http://katlas.org/wiki/8_19
[3] 'Active-Metal Template Synthesis of a Molecular Trefoil Knot' Perdita E. Barran et al, Angew. Chem. Int. Ed., 50, 12280-12284 (2011).

Colin Byfleet

Growing up in Harrow, north-west London, I enjoyed an excellently-run Scout group where knots and lashings were enthusiastically taught and used. We even had a precious copy of Ashley, although I little realised its importance at that time.

Distractions followed (girls and exams) and knotting took a back seat. Learning to sail on a gravel-pit lake at St Ives in Cambridge and a bit of dinghy sailing brought them back to the fore for a while.

Thirty busy years of work, family etc followed and knotting again disappeared into the background until involvement with the now sadly-defunct Exeter Maritime Museum, via my wife, Jackie, began in the mid-1990s. A visit to the maritime festival Brest 2000 brought us into contact with Ken Yalden and the Solent branch, and we joined the Guild very soon thereafter.

I foolishly replied to a request in *Knotting Matters* for a new Supplies Secretary - and was given the job because of the lack of competition. At the 2010 meeting in Weston-super-Mare, I was cajoled into joining the Council and discovered the inner workings of the Guild. The following year, at the meeting in Coventry, I was asked to be President, an honour for which I was ill-prepared, especially since our long-standing Treasurer and Secretary both finished their time in office at the same meeting.

I am pleased that the re-organisation into Council of Trustees and Executive Committee, forced upon us by our status as a Registered Charity, now seems to be running smoothly.

Following the Autumn meeting in Sweden in 2010, I became interested in circular mats and their mathematical analysis. Whilst rather immobile recovering from knee surgery, I was able to sit and make many of the mats.

After a career as a chemical physicist, my time with the Guild has taken Jackie and me to many really interesting meeting places and, more importantly, put us in contact with many splendid colleagues. The Guild is quite the friendliest organisation I know and I am delighted to have been a small part of it.

Palms Ancient & Modern

By Des Pawson

Fig 1 Sailmaker using a palm,
David Steel Elements of Sailmaking 1794

Pushing a needle through sailcloth is no easy matter; the proper tool, a sailmakers palm, makes all the difference. This leather, glove-like band, fitted with a metal plate and used to push the heavy needles, is the quintessential tool of the sailmaker.

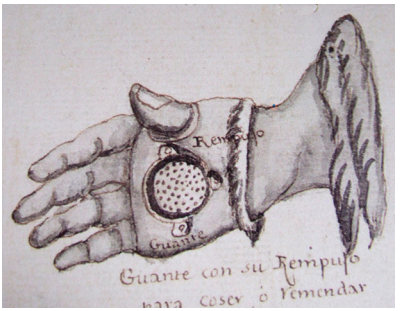


Fig 2 A Spanish palm circa 1719-56

From the simple beginning of a disc of metal with indentations, sewn to a piece of leather, a wide range of styles have evolved.

In the 1920s one British maker offered 30 differing styles and that does not include the offer of a left or right hand model for each style.

Henry Woolley & Sons,
REDDITCH, Eng.
CONTRACTORS TO WAR OFFICE, ADMIRALTY, INDIA OFFICE, HOME OFFICE, and PRINCIPAL RAILWAYS.
MANUFACTURERS OF EVERY DESCRIPTION OF SAILORS', SAILMAKERS', AND SEWING PALMS, BELTS AND SHEATHS, SHIP CHANDLERS HARDWARE, Etc., Etc.
SAILORS' PALMS.
1 Straight Palm, common.
2 Crooked Palm, tied to hand, half lined hide.
3 Crooked Palm, tied to hand, double hide.
4 Seaming Palm, Liverpool pattern, tied, double hide.
5 Seaming Palm, buckled, Liverpool pattern, tied, double hide.
6 Roping Palm, Liverpool pattern, tied, double hide.
7 Roping Palm, buckled, Liverpool pattern, tied, double hide.
8 Seaming Palm, circular pattern, hide round thumb.
SAILMAKERS' PALMS.
9 Seaming Palm, iron plate (neat).
10 Seaming Palm, steel thimble, plain thumb.
11 Seaming Palm, hide all over, steel plate, extra stout.
12 Roping, same as No. 11.
13 Best Padded Seaming Palm, steel plate, sewing pad.
14 Seaming Palm, steel plate, same as No. 11, but narrower and lighter.
15 Dutch Palm, solid iron round.
These illustrations show just a few of many patterns made by us. We shall be glad to submit prices to any specification.
Our Combination Consists of BEST QUALITY WORKMANSHIP and a REASONABLE PRICE.
16 Sailors' Belt and Sheath.
Fig 3 Palm makers Henry Woolley & Sons, catalogue circa 1930

There are two main types. Firstly, the seaming palm for sewing the seams, which uses a smaller needle and has an iron with small indentations.

Fig 4 A couple of Seaming Palms

Secondly, the roping palm, which has larger indentations on the iron and the leather is raised round the thumb, where a turn of the twine is often taken to get an extra pull to tighten the stitches. Roping (sewing the rope round the outside of the sail) takes a larger needle with thicker twine and is heavier work altogether.

Fig 5 A Couple of Roping Palms

Fig 6 Three Sailors' Palms: Top Liverpool style, Seaming (Left) Roping (Right); bottom the most basic Sailors' seaming palm.

There are also lighter and cheaper palms usually sold in the past as 'sailor's palms'. Today some of these have their iron held in place with a plastic moulding rather than the rawhide used in the past.

Many styles and variations exist within these categories, built up with various layers of leather and rawhide, and different qualities and styles of irons. Different areas of Europe developed their own distinct styles, most of which tend to be lighter and echo the earlier style of palm with a disc with indentations and lugs by which it is attached to the leather part, these are sometimes called "Dutch Style."

A wide range of palms is still available today. Anyone who intends to do much heavy hand work on traditional sails may wish to invest in a heavy sailmakers palm, ideally both a seaming and a roping palm. It is said that you can, at a push, seam with a roping palm but not rope with a seaming palm. A heavy palm will need to be broken in like a pair of army boots. The basic principle is to soak it in water for a couple of hours before bending and moulding it to your own hand

and working with it in this state so it really fits you. The lighter weight sailors' palms and the 'Dutch style' are more flexible, but even then when a palm gets moulded to your hand, try not to lend it out!

Whichever palm you choose, check that when you hold the needle between your thumb and forefinger, the needle rests squarely on the angled iron. Watch out because some of the very cheap 'Dutch style' palms being offered for sale today are made in Pakistan and the wedges of leather used to give the iron the right angle have been inserted incorrectly, however it is not a major task to take it apart and remake it.

Many sailmakers who use their palm for hand work all day, every day, sewing miles in a career, will often modify their palm, shaving an irritating piece off, or adding a little soft leather padding, indeed sometimes rebuilding it completely.

If you are without a palm, a small coin with a few dents bashed into it, sewn through four holes to a band of leather, could get you out of a tight corner and you would be revisiting an 18th century sailmaker's palm.

© Des Pawson 15.10.2015

Fig 7 A Selection of European Palms

Des Pawson MBE

Co-founder and now Trustee of the IGKT. Lives in Ipswich, Suffolk UK.

70 years old, professional ropeworker, now semi-retired, interested in sailors' ropework, the tools of the rope and canvas working trades and ropemaking. Author of a number of books on knots & ropework, the latest in September 2016, *Des Pawson's Knot Craft & Rope Mats*. With his wife Liz runs the Museum of Knots & Sailor's Ropework.

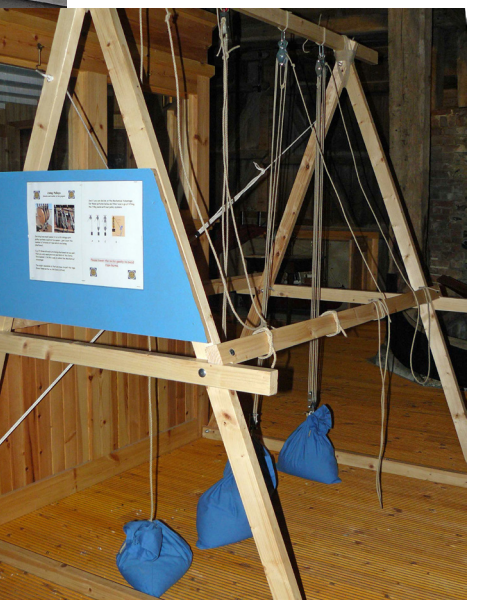
A DEMONSTRATION RIG

By Richard Hopkins

A demonstration rig for blocks and tackles.

At public demonstrations over several years, the West Country Knotters have employed a rig devised by Nick Cockroft to show the public how blocks and tackles work.

The rig is reasonably easy to set up providing you remember the correct spanners and don't drop your nuts. I was asked to make a similar, permanent, rig for a museum and this needed to be larger and took quite a time to assemble.



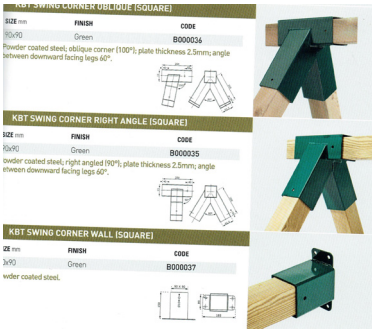
A friend suggested using a children's swing frame and I subsequently acquired one, but the component limbs are too long for my car and have to travel on a roof rack. Again the assembly needs a spanner and is not totally straightforward.

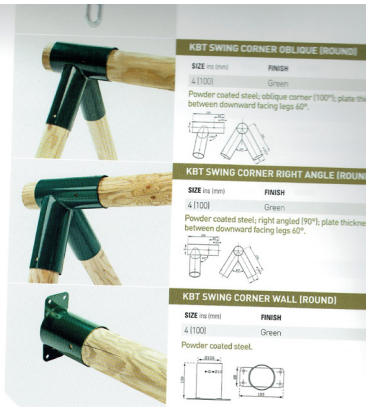
Then I was given the remains of a garden swing/hammock frame and this fits together easily although it is not as tall as the original so is easier to transport.

However, while attending a recent Trade Show, I noticed one stand displaying all sorts of farm equipment and outdoor gates etc. In the children's play section were brackets that would make building one of these rigs extremely easy and would be rapid to assemble and dismantle.

Enquiries discovered that each bracket is about £48 so a rig will be expensive as there will also be the cost of the poles to insert into the brackets.

However I am sending pictures of the brackets as I feel sure that members with access to welding gear and a few lengths of scaffolding tube could easily make a rig for a much reduced sum.





The commercial brackets accommodate three inch diameter poles or four inch square poles but for a demonstration tackle rig they could be much smaller. The same size as scaffold poles even. In fact, if scaffolding poles are used then scaffold brackets will do the job perfectly as long as you have the correct size spanner.

Fine details of the construction would be decided by the operator but I submit the suggestion for further improvement.

[Should anyone want the commercial brackets, the wholesale supplier is Birkdale and they have a helpful customer service department which will provide details of a local supplier if you just email your postcode]

Richard Hopkins retired nearly 9 years ago after a wide variety of jobs ranging from polymer research to teaching monkeys to watch television, via banking, commercial security, industrial archaeology, even a short spell in a call centre. Meanwhile, he became an archery instructor, made boomerangs, and was involved in reconstructing a number of chariots for museums and television.

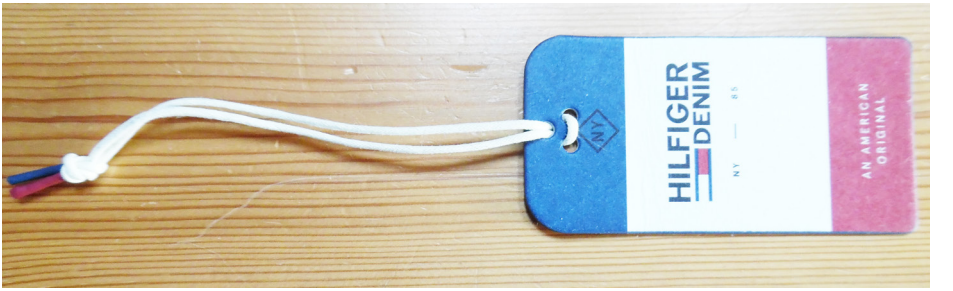
He has found retirement to be busier than work, as an interest in too many things eats up his time. Apart from collecting books on a wide range of subjects his other main hobby (apart from practical knot tying) is collecting locks and keys. He hates to have his photograph taken.

A SIMPLE KNOT

By Des Pawson

A simple knot worth admiring

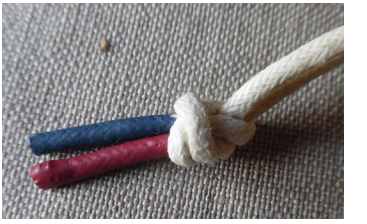
One of the regular features of the East Anglian Branch Meetings is 'New Knot' the idea being a new knot that each of us has learned or encountered. We are very flexible in our interpretation of this theme, at our last meeting Tony Lee showed the label that came attached to a pair of jeans that he had recently purchased.



This label generated a lot of interest even though the knot was perhaps the simplest, an overhand bend or thumb knot *ABOK* #1410 we were all very impressed by the way in which the coloured tips of the string gave the impression of being different to the main body.

We wondered how this could have been achieved, was the knot tied by machine or by hand? How were the coloured ends created? It appeared that they had been dipped in some kind of plastic, which we thought must have been done before the knot was tied, but to a very specific length. The knot needed to be tied after the threading of the string through the 3 openings in the label itself.

The knot itself did not appear to be dressed particularly well but that may have been the result of many hands trying to establish the how and why. All in all, we admired the skill, be it hand or machine design that had created something special from a simple knot.



SOLID SINNETS

By John Richings

Solid Sinnets See *ABOK* #3042 to #3082

Each one of the solid sinnets is specified in terms of 'space', 'strands in each space' and the moves 'From' and 'To'

Equipment

The table – (see photo p30). Mine is 24cm diameter and 33cm high with a 5cm hole at centre.

In the table I have drilled 80 holes around the periphery, 1.5mm diameter. In these at appropriate positions are brass pegs. This keeps the cords separate 'space' from 'space', important when you build sinnets of 10 spaces or more.

Weights – Centre weight, a bag of steel weighing about 600gm. Cord weights, resealable polythene bags filled with gravel, each weighs about 30gms (if needed use say 2 poly bags per cord)

Sinnet Discs – I've made a disc for each sinnet. Each one (made of card) has the spaces numbered anti-clockwise and the number of cords in each space at the start of a circuit.

Method

Cut the strands – each one should be at least twice the length of the finished sinnet (Mainly I use 1.5mm 8-plait nylon cord which I dye myself. It avoids waste!

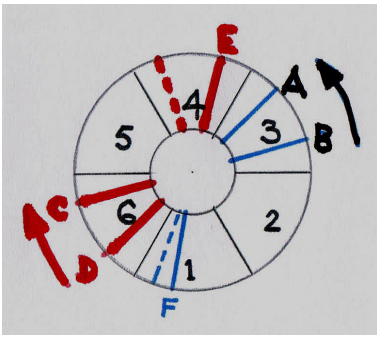
Attach the cords to the central weight bag – use a small steel S hook. As the sinnet grows the centre bag will descend and at some point you'll need to attach the bag higher up the sinnet – use a cow hitch loop around the sinnet to re-hook the bag.

Attach small bag weights to each strand so the the bags are close to the ground – they, of course will gradually ascend so you'll need to move the bags down the cord. The purpose of the bags is purely to keep a constant tension on the cord, so the thicker the cord, the heavier the weight.

Now Ready to Start

1 Referring to the diagram opposite: All cord moving from an EVEN numbered space to an EVEN numbered space, moves in a CLOCKWISE direction. All cords moving from an ODD space to an ODD space will move in an ANTI-CLOCKWISE direction.

2 Imagine the cords around the disc like a queue of cars. When a cord moves to a new space it is put BEHIND the cord already in that space. If there are 2 or more cords in a space, the one that is moved is the one 'at the head of the queue'



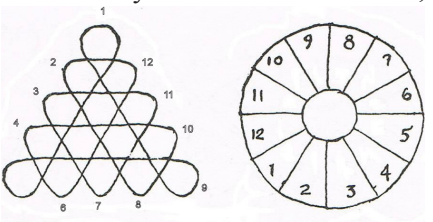
3 In summary,
'C' moves to red dotted position behind 'E' from space 6 to 4
'A' would move to dotted blue line behind 'F' from space 3 to 1

4 Generally, strands move EVEN to EVEN or ODD to ODD but there are exceptions. If required EVEN to ODD then 'C' would move to behind 'B' conversely, ODD to EVEN, then 'A' would move to behind 'D'.

5 Let's do it. Refer to the 'Moves' instruction and move each strand to its new location. Never leave the work halfway through a circuit. Although the instructions say clockwise or anti-clockwise, if you make the moves like the hands of a clock moving you'll develop a twist in the sinnet. To minimise this move the cords the shortest distance, across the centre to its new location.

6 Some sinnets lend themselves to multiple colours. By referring to the 'Move instructions and tracing the path on the diagram on the left (in this case *ABOK* #3047) you can work out how many different colours you can use. In this case, three.

Space	Strand	From	Direction	To	Colour
1	2	1		9	A
2	1	8		2	C
3	2	3		7	B
4	1	6		4	C
5	2	5		1	A
6	2	12		6	C
7	1	7		11	B
8	2	10		8	C
9	1	9		5	A
10	2	4		10	C
11	1	11		3	B
12	2	2		12	C

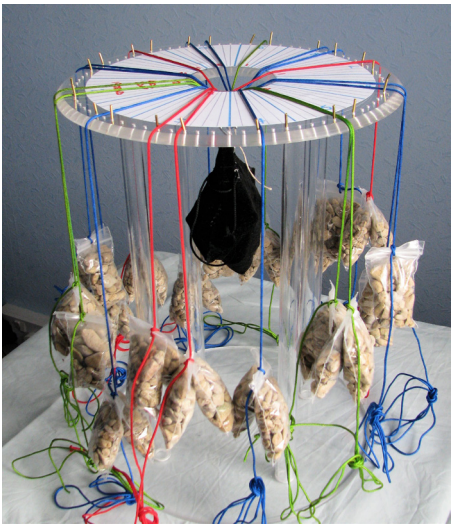


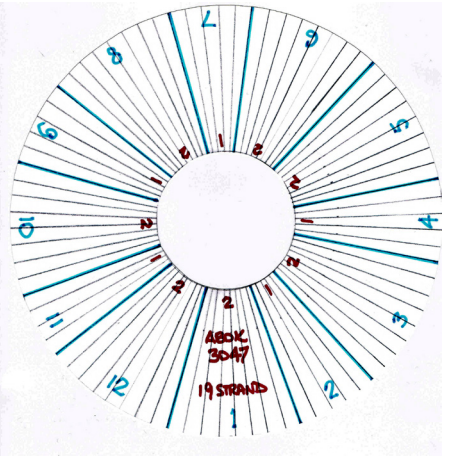
An example of a grid for producing a solid sinnet:

a) The first two columns in the grid merely give number of cords at each Space and the cord colours.

b) The 3rd, 4th and 5th columns give the movement of a cord from a Space number to a different Space number and the direction of travel…..either clockwise or anticlockwise. This latter is important if there are 2 cords at the 'from' Space and using the queue principle will determine which of the two cords is moved

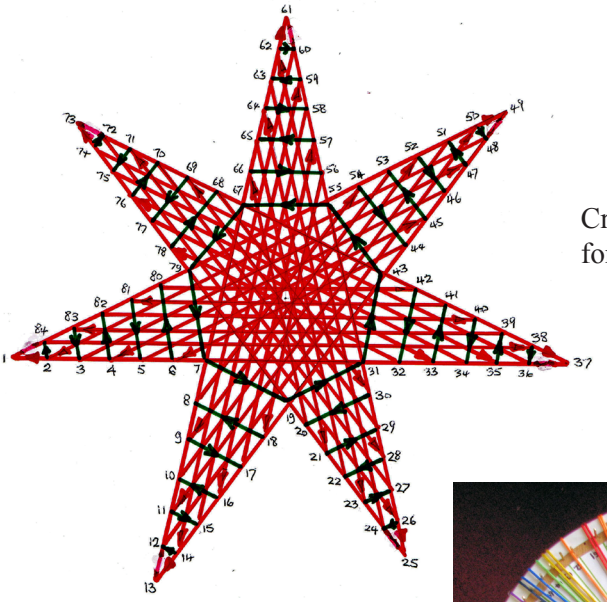
c) The 6th column merely confirms the colour of the cord moved.



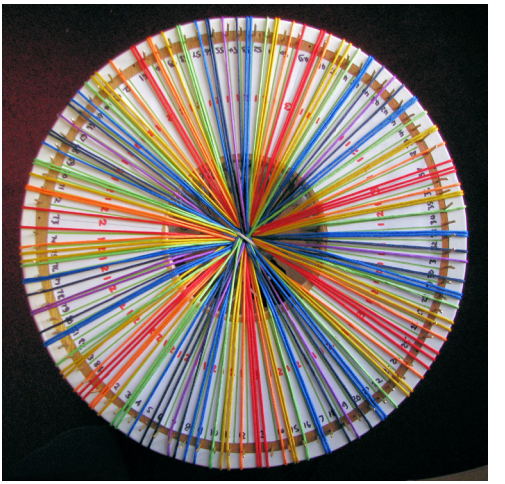


Above are pictures of my table showing the cords with weight bags, a sinnet disc, and the finished sinnet made into a bracelet using 1.5mm diameter 8-plait nylon cord which I dye myself.

After I'd completed all the *ABOK* solid sinnets I thought I would try something bigger, a 127-strand heptacle (7-pointed star). See opposite.



Crossing diagram for the heptacle



Sinnet disc for the heptacle

A length of the finished heptacle sinnet

John Richings

I'm 79 years old. My very first introduction to knots was as a Wolf Cub in 1945. Just after moving into Scouts, we celebrated the 40th anniversary of scouting and our troop built a replica of Tower Bridge. Before I learnt any more knots or lashings, I first became competent at the Sailmaker's and Palm and Needle whipping for all the new rope that was involved in the project. The longest spars we used were 20ft, the towers were 30ft high and the decking was made of railway sleepers. I achieved my Queen Scout in 1953.

I was first encouraged in knotting - when an apprentice on the docks - by a foreman rigger who had been to sea in sail.

After getting married and moving around the country, I came back to Scouting in the early 70s. Back at my old Scout Group which now had the distinction of being Admiralty-recognised.

Eventually, I moved onto District work, the South Glamorgan Adult Leader Training Team and then Assistant County Commissioner.

I really started seriously doing the sort of project such as the sennits in these 'still life' pictures about 10 years ago. I came across Charles Hamel's website and his friends' contributions to the site. Charles is an avid disciple of Schaake's academic analyses of Turks Heads, Herringbone and Pineapple knots.

Now there is software available, designed by Charles and Claude Hochet which makes it a bit easier to design knots..... in fact it did get a bit competitive.

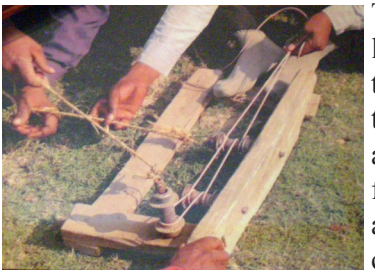
Finally, I must confess to not doing much knotting for about 12 months.

A CORD MAKER

By Richard Hopkins

Some time ago I was shown a cord maker operated by pulling on a piece of string and was told that it originated in the Himalayas. Quite a while later, I was shown a 'Tibetan' cord twister which worked in the same fashion.

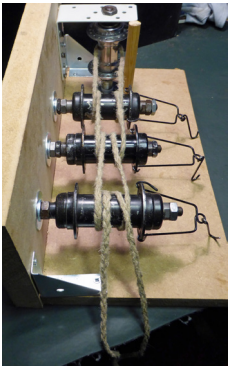
The idea was mentally filed and almost forgotten until the AGM at Henley Rowing Museum when I saw an exhibit in the museum showing how the Thames and Ganges twinning project was trying to improve the environmental quality of the water and communities along the river.



They had a photo of the old gadget that the locals used for cord making and an example of the 'modern' version which they were providing to fishermen so that they could create an alternative livelihood by making mats and cord furniture. It amused me to think of the Thames and Ganges Twinning project being so closely connected to making twine.

At a car boot sale recently I bought, on impulse, a load of old bicycle wheels and so I considered making a machine utilising the hubs from the wheels.

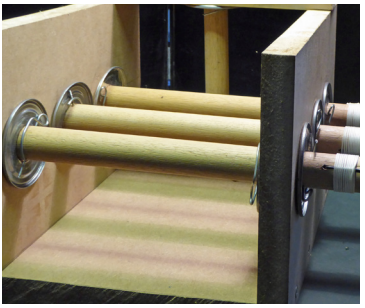
The examples I had seen only appeared to have two spindles but I decided that I would attempt a three strand device. My first concern was to make the spindles on the hubs extend far enough to fit through the frame so that they could be secured. Not all the hubs I had acquired were long enough and then I got very greasy taking the hubs apart and screwing the axles out before re-assembling the bearings and ensuring free running.



Next I needed to find a support for the end spindle around which the operating cord would return. A suitable bracket was found in a hardware store and screwed to the side support. Holes were drilled into the board for the spindles and eventually the thing was fixed together as shown in the photograph.

Using spokes from the bicycle wheels I made fittings to go through the holes in the hub rims and hooks to which the strands easily could be attached when in operation.

The operating cord was a flat 3-plait length as I believed that the extra surface area would give better traction on the hubs.
It works OK but requires far more effort to turn three spindles than just two. Maybe they got it right originally.

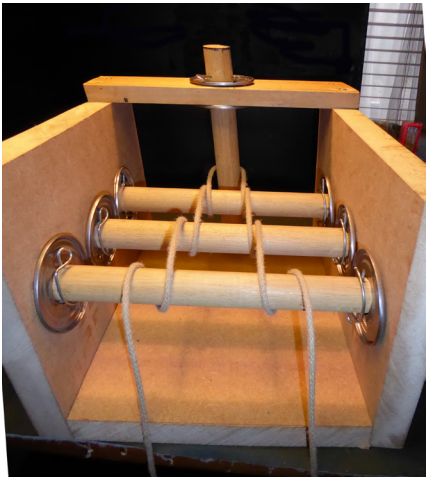


Encouraged by the success of the first device I thought that I might make an all-wooden machine utilising more scraps from my shed. This would need supports for the spindles on both sides as there were no axles that I could bolt onto a frame and also no bearings to allow free rotation.

One problem I encountered was that the drill bits I possessed were not the same size as the broom handles which became the spindles. Thus the holes in which the spindles rotate are larger than they should be and unless action was taken to improve the situation the spindles would just pop out of the holes.

My first idea was to put wooden pegs through the shafts similar to lynch pins on a wagon wheel but the shafts would still rattle in the oversize holes and the wooden pegs would increase the effort required when they rubbed against the frame.

This is where a butterfly mind and soup tins came together. I salvaged a number of soup and baked bean tins and cut off the bases. A cold chisel opened up holes that were a reasonable fit on the axles but these then had to be kept in place.



Using spokes from the wheels I made clips to retain the axles and also fittings for the ends of the rods to allow the hooks to be fitted. The thin metal clips have very little bearing surface on the tin lids so friction is greatly reduced. It was also easier to drill and fit them as wooden pegs might have dropped out after a time.

Because of rotating the shafts tapered pins might not have been adequate. It still rattles though. I considered filling the space with a lubricant soaked cloth sleeve but this might bleed through and reduce the grip of the drive cord so I left it for the time being. I may return to it if I get a brainwave solution.

The end fittings were seized in place although I do not think that this step was really needed as the return bends on the side arms lock the fittings quite firmly.

The return post is supported below by two strips of soup can, cut and nailed in place, as I did not want anything projecting under that frame. At the top are two tin can washers and clips to stop it jumping out of position in the event of undue enthusiasm by the operator.

In operation, the thing needs to be anchored very securely and so G-clamps to hold it to the table are essential, although the originals appear to be held in place by the feet of the operator while sitting on the ground, and possibly by pegs into the earth.

One 'advantage' of the wooden machine is that it can produce right or left laid cord depending on which end of the axles the strand are attached. Provided that only thin stuff is needed it might be possible to produce left and right simultaneously.

The threading of the drive cord is difficult to describe but easy to do as can be seen in the photographs. To operate, one end of the cord is pulled through, thus rotating the spindles and then allowed to go slack. The other end is then pulled back but, because of the way the cord is threaded, the direction of rotation remains the same. A to-and-fro action of the hands is used which can be tiring.

I took the machines to our local West Country Knotters meeting for an appraisal. The general opinion was that they should work, but the friction problem encountered when three axles were engaged caused a bit of head scratching.

Gordon Court realised that as the cord is pulled the axles are forced towards one another and so friction is increased to an unacceptable level.

We therefore fitted a separate drive cord to each shaft and by grouping the left and right cords together were able to rotate all the axles very easily. It seems to us that this is a more efficient method of drive and one that is unlikely to tire out the operator.

Time has prevented me from making any substantial cord but the principle seems sound.

Working in a Yacht Chandlery

By Our Roving Reporter

Steve Harvey, 64, the longest-standing employee at Arthur Beale's – one of London's oldest chandleries (130 years on the site), originally started working at Thomas Foulkes Chandlery in East London as a way into retail, and stayed there some twenty years until the recession forced them to close in the late 1980s. While there, he learned some basic knots and splices, but not much more. He then moved to Beale's where he has now been for about 24 years. It was at Beale's, working with Mr Coleman (the company's previous boss) who used to do all the rigging and rope-work, that he really got into knotting. Mr Coleman was not really a teacher, so Steve is mainly self-taught though watching Mr Coleman work, he picked up many tricks of the trade.

Apart from the work directly linked to yachting, Beale's also supplies interior design needs. They make bespoke banister ropes (from 24mm 3-strand rope with manrope knots and brass or chromed-brass brackets), curtain tie-backs, rope 'skirting', as well as smaller work specific to fashion.

Last year the shop hosted 'Countercurrent' - An Exhibition by Staff of BA Jewellery Design at Central Saint Martins. For this exhibition, Naomi Filmer showed what looked like a pulley-block, which was actually sculpted in two different hardwoods, to which Steve added rope work in synthetic hemp with splices, a Turks Head and a Monkey's Fist.

Steve makes Monkey's Fist key-rings for the shop in two sizes: 3-part and 4-part on two different sizes of marble using 4mm 8-plait matt polyester, which is about the only suitable material that comes in different colours.

Many examples obtainable on the internet are made of paracord which is shiny, slippery and flattens when tightened and, in Steve's opinion, don't look as good.

It turns out that Steve's 'Monkey's Fists' are, in fact, 3L x 4B Turks Heads which are a lot less time-consuming to make and which Steve thinks have a nicer appearance.

Steve will try any sort of bespoke work if clients can give him a clear idea of what they are looking for, from bracelets, chokers or fashion jewellery to mobility aids (below).

One idea that Steve developed himself as a Christmas present was port and starboard ear-rings and chokers. They are packaged with a small poem he wrote, called 'Side Guide' to help people to remember their port and their starboard.

Side Guide

Since none of us are perfect
Or without a single fault
It's no surprise that some don't know
Their Starboard from their Port
But it's really not as simple
As merely Left or Right
So don't think their confusion
Is because they're none too bright.
Some use: 'Any Red Port Left?'
Which should make Starboard Right
Cos Starboard's all that's left you see,
But at Sea, that isn't right.

For the rules are ever changing
When you step aboard your craft
It's Right when facing Forward,
But Left when facing Aft.
On boats both Port and Starboard
Are a reference to her sides
And which of them is Left or Right
Well – Fore and Aft decides.
So wear this when your struggling with:
"Which side is Which at Sea?"
Then face the bow (or Sharp End)
And check your jewellery.

Over the years, the materials that the Chandlery uses has changed from the range of natural fibres to synthetic materials such as Classic: a polyester lookalike – favoured over nylon because nylon yellows – not a very convincing lookalike, but pretty much impervious to most things.

Hempex is a much more natural-looking synthetic and only close examination (or a flame) identifies it as not being a natural fibre. There is a plethora of different materials available, often with highly specialised uses, which can then be combined to make the most of their different characteristics.

Many yachtsmen now favour braided ropes because they run well through blocks, don't kink and are lighter and stronger. Looking at some ship's bell-ropes, those sold by Beale's are bought from another company for a price that probably means that they are made somewhere in the third world.

*** We are very grateful to Arthur Beale - Yacht Chandlers and their staff for their kind assistance with this article**

Steve can and has made bell-ropes, but they take a lot of time and therefore would cost too much. If making his own, Steve would probably start with braided hemp; the shop sells different sizes from 1.5 mm in various diameters up to 5 mm. It used to be possible to get glacé cotton in an 8-strand braid with a matt finish and came in different colours but is no longer available.

Mr Coleman used to make a splice that seemed to be exclusive to Beale's which Steve presumed he had picked up from his rigger, who had done a full apprenticeship with British Ropes, and then worked for Beale's until he retired. It was called a 'locking-tuck' splice. Steve had never found it in any of the literature, but recently someone came into the shop and talked of the 'lock-tuck' splice in regard to wire rope splicing, so it is possibly a technique that has been transferred from wire-splicing. (For wire splice see http://shipofficer.com/so/wp-content/uploads/2015/02/3.-Splices.pdf *Editor's note*).

Steve thinks that colleagues get fed up with him saying that schools teach woodwork, metalwork, sewing, typing and things like that, but the only knot they will teach is how to tie shoelaces. Better to learn a few knots very well – so as to be able to tie them behind your back or in the dark – rather than lots of them not very well.

Beale's advertise a splicing class on the website and in their newsletter. Participants learn an eye-splice and apply this to making something like a dog-lead that they can then take home. This led to various people asking whether Beale's could run something similar to teach knots, and a class (of about 15-20) learned the following: Reef Knot, Bowline, Clove hitch, Rolling hitch and Alpine butterfly. Steve seemed pleased to be able to say that though some people only came to the class to accompany a friend, many left as 'bitten' as the person they had accompanied.

Over the years Steve has collected his own library of knotting books, the following are a few that he rates and consults the most, and some of his comments on them.

ABOK (2nd edition). Used more for reference as the diagrams are not the clearest for learning new knots.

Hervey Garrett Smith, *The Marline Spike Sailor* Good practical content, the language can sometimes grate.

Jan-Willem Polman, *Splicing Modern Ropes: A Practical Handbook.* A must-have for anyone working with modern synthetic ropes. This book shows a very clear, fool-proof, way to make a "soft shackle knot" (pp 99-102), which is really a 2-strand diamond knot (*ABOK* #787). For Steve, these illustrations helped turn his tying from a bit of a hit or miss process into a sure thing.

Tim Davison and Steve Judkins, *Knot Know-how.* This is a great book for beginners because of its layout, clear diagrams and explanation of what each knot is used for.

Stuart E. Grainger, *Creative Ropecraft.* The contents of the book might not be particularly different, but the range of knots and braids is impressive and the illustrations are particularly clear and helpful.

JD Lenzen, *Decorative Fusion Knots.* Contains a number of original and striking knots and sennits, including the Spinal Sinnet. Lenzen also does very good demonstrations on the internet.

For Steve, "Knotting is rather addictive".

Thou Shalt Knot: Clifford W. Ashley

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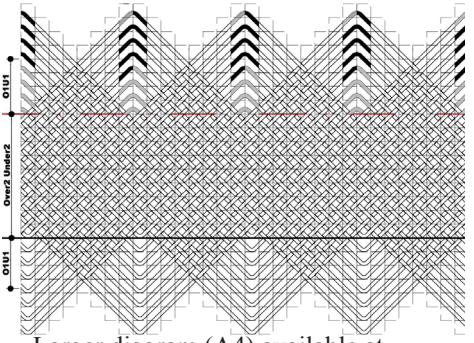
PEN AND STAND *

in Hound's Tooth Pattern by Jim Caswell

Creating a Turks Head with a hound's-tooth pattern seemed like an interesting challenge, and a bit of research found that "traditional hound's-tooth check is made with alternating bands of four dark and four light threads in both warp and weft/filling, woven in a simple 2:2 twill, two over/two under the warp, advancing one thread each pass". I decided it should be possible to achieve as interweave for Turks Heads.

After a bit of thought and experimenting, it became obvious you need to work knots that have parts in multiples of 8+1 to ensure sets of four of each colour lying close and parallel, and bights in multiples of 8 so the pattern is not disrupted. At last I covered the Pen, and that worked so well I wondered if it was possible to make a stand as well.



Larger diagram (A4) available at
http://www.igkt.net/index.php/km/supplements

I was rather pleased with the results and am proud to say I won a blue ribbon in the 'Knotted Article' class at last year's NSW Plaiting and Whipmaking Competition.

Both items were worked with Kangaroo Leather lacing which is very forgiving and can be cut to the rather precise widths required when you need to cover items with a fixed surface area. *** see back cover**

The Pen (blanks available from wood turner suppliers) is covered by a 65p x 8b Turks Head laid with two strands each 1.5 mm wide (4 consecutive bights as Black and 4 as White) in O2U2 pattern. (NB: 65p = (8 x 8) + 1P). Each strand was about 1m long.

The Base is from a 65mm diameter x 50mm high pine 'Bun Foot' from a hardware store, with a 20mm hole in the top meant for bolting to the base of, say, a chair. It is covered by a 25p x 4 sets of 8 nested bights with alternating 4 Black + 4 White strands 4mm wide with O1U1 pattern top and bottom, and O2U2 pattern between internal bight sets. Each strand was about 2m long and the 16 ends were conveniently tucked into the hole and held in place by the Pen 'trumpet' which receives the pen, made from the plastic tip of a silicon gun.

SECURING A LOAD

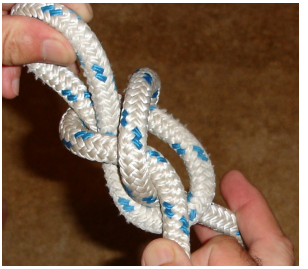
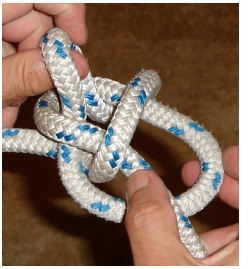
By Bryan Willis

I expect you get many messages like this, but I'd like to inform you of a knot (actually a hitch) that I believe I have invented, for tying down loads on, for example, a car's roof rack or a trailer.

The object is to form a loop (without access to the bitter end) which doesn't slip or tighten, but which, even after having been under a lot of tension, can be easily untied.

The hitch is tied in the rope which has been passed over the load, the end is then taken round the fixed ring (bar or hook) and back through the hitch, and hauled down tight (up to 2:1 purchase depending on the friction) and then back to the ring (bar or hook) to be tied off. When the tension is released, the hitch is untied by breaking the back of the knot as you would untie a bowline.

I attach a series of pictures to explain how the hitch is made: you begin as if tying a clove hitch. (Follow the pictures clockwise from top left.)

Editors' Note: We *think* this is the same as a loop knot described by Ashley (*ABOK* #1034). The author's exemplary illustrations are so easy to follow, and the knot so good at its job, we have no hesitation in sharing it.

A G Schaake

By Nautile (translated by J-P Durand)

Albertus Georg Schaake: this unknown man!

Born in the Netherlands in 1933, Albertus Georg Schaake took up engineering studies in Delft before emigrating to New-Zealand in 1962. He taught engineering at the Waikato Polytechnic School in Hamilton.

Over thirty years, he dedicated countless hours of study and practice to knot tying, in particular the creation of decorative braids. For a mathematician, a knot is a braid, and a Pineapple is evidently a "braided" knot.

At the end of the 1980s, he decided to publish his findings. He made friends with J C Turner who helped him with the publication.

He was a prolific author whose writings were always based on personal experience, and very few knot tyers, including professionals, are able to compete with him in the creation and the profound understanding of the innermost structure of those knots, each of which is clearly different from all the others.

He was never accorded the slightest recognition, including by IGKT, to which (I know from J C Turner) he sent his publications*. It seems that knot tyers have been overwhelmed by his publications, among which I can name, off the top of my head, about 60 copies of the magazine *The Braider*, each of which contains three or four articles (text and diagrams).

In all, more than 1,400 pages published between roughly 1995 and 2005, and a dozen booklets (pamphlets) of between 13 and over 200 pages, each of which contains an in-depth study.

Here are some of those twelve titles:

- *The braiding of column-coded regular knots,* 37 pages,
- *The braiding of long column-coded regular knots,* 13 pages,
- *The braiding of row-coded regular knots,* 25 pages,
- *Braiding regular knot,* 127 pages,
- *Braiding standard herringbone knots,* 209 pages,
- *Braiding standard herringbone pineapple knots,* 203 pages.

You must not be afraid of theory, or else you must also be afraid of textbooks, dictionaries and such like, that bring clarity to fields which are only complex if you don't have the instructions. Knowing the theory means having real control.

Thanks to A G Schaake, it is possible to discuss *cylindrical knots* with accuracy, but this ability has been used by only very few knot tyers. The tremendous body of work built up over so many years represents a vast amount of reading which might put some people off.

However, fortunately you can access these copies of *The Braider*, as well as the specialized books, as 'tutors' to undertake your own exploration of the fantastic field of cylindrical knots, by using two not very well-known bits of software, each of which replaces several books.

This article first appeared in *Sac de Noeuds*, the magazine of the Guilde Internationale des Noueurs, France. It has been kindly translated for *Knotting Matters* by Jean-Pierre Durand, with an addendum by Antoine Leroy.

The first one is *RKB (Regular Knot Builder):* it reflects, strictly and comprehensively, the work of A G Schaake. For multi-strand knots or assemblies of several cylindrical knots, you will have to use the second one - *Ariane*.

Ariane: the braider is based on Schaake's work but does not follow it slavishly as does *RKB*. The braider (which, of course can also do single strands) uses a proprietary algorithm of Claude Hochet.

Read A G Schaake and then check your understanding (of what you have read) using the software. By doing so, admire the colossal work of the man who did not have the benefit of the software and never developed an equivalent. He used diagrams drawn on isometric charts.

He built everything with his ideas projected on those charts whilst checking not with cord but with (leather) lace, as cylindrical knots are better adapted for a flat lace than for a round strand, hence *The Braider*.

Many thanks to A G Schaake, who left us at the beginning of September 2009, leaving a fabulous intellectual treasure for those willing to go and explore it.

PS Although C W Ashley wrote, as an empirical observation, "A knot of one string is impossible in which the number of parts and the number of bights have a common divisor (greater than 1)", A G Schaake and J C Turner were the first to have offered a mathematical proof that for single-strand THs, the number of leads and the number of bights are always prime to one another (ie their only common divisor is 1).

*** Editor's Note**

A G Schaake's work was, in fact published and referred to in Knotting Matters:

- *KM* 27 p 4-5 presents *Braiding Regular Knots,* p 8-9 Book Review by GB.
- *KM* 28 There is a letter from J Turner, talking of their work and upcoming presentation to the Mathematical Society.
- *KM* 32 p16 Mobius Braid Turk's Head, Schaake, George & Turner, John.
- *KM* 35 p 6 Proof of the law of the Common Divisor in Braids, Turner JC & Schaake AG.
- *KM* 53 pp13-24 Tom Hall-Fiador Knots makes reference to Schaake's work.
- *KM* 100 p 34 Proof of the Law of the Common Divisor in Braids, Turner JC & Schaake AG.

BOOK REVIEW

By Jim Caswell

A Comprehensive Text of Turk's Head Knots

By James Edward Harvey

This is indeed a comprehensive text but certainly not one for the beginner. This is a book by a dedicated expert with an intimate understanding of his subject, who justifiably took great pride in his work, writing about what he knows for an audience which he assumes knows what he is writing about.

The author acknowledges he was taught the art of raising a knot by formula. called 'The Rule' by his maritime peers and states that "All knots after completion can be raised or increased to a larger knot by using formula A or B." 'The Rule' (or 'by formula') and 'formula A or B' are subsequently referenced throughout the text in support of the numerous explanations and excellent diagrams but frustratingly, I could find no definition of these concepts.

After some analysis, a bit of research and some expert suggestion (thanks Ed), I believe formulas A and B simply refer to be the method of raising a knot (increasing the number of Parts and Bights) by what I understand as 'laying and then splitting tracks'. Formula A being the approach where the working end is taken back through the knot on the 'inside', where a new bight is created immediately before the standing end, and formula B where it is taken back through the knot on the 'outside' where a new bight is created immediately after the standing end. The inference in the text is that 'The Rule' was learnt as a mnemonic. I'm rather hoping some 'Old Salts' out there might remember such an *aide mémoire*. If so, I'd love to hear it.

I suggest the key to approaching this book is provided by the author's warning on the second page: "Some people spend hours working out crosswords, others like to solve chess problems or Chinese puzzles. This is a book for those who like a challenge." It certainly is that and, like all good puzzle books, contains lots of cryptic clues, mysterious codes and head-scratching to find the answers but there are hidden gems that make the effort worthwhile. Even the most accomplished knot tyer would have to be impressed to read that James Harvey considered the 20 x 11 Turks Head Base Knot "... about the largest base knot that can be formed on the hand". I find that wonderful. Now there's a challenge! The illustrations of completed projects alone are a superb reference of examples of what is possible even if it is not entirely clear how it is possible and, for that reason alone, I suggest this book deserves a place in any enthusiast's library.

Obsessing about THs?

By Maurice McPartlan

The article on Schaake (p 42) and the Harvey book review (p 44), have had me consulting my books and the internet (thanks Phil and Marko) in search of answers about enlarging THs, and how the two methods work. There are plenty of books and videos offering step-by-step instructions on how to enlarge THs to make bigger ones, but none of them seem to go back to first principles, to something that might serve as a more general rule on how to carry out the enlargement process.

I have since found two pamphlets by Schaake (3 and 4) about enlarging THs, but have not yet had the courage to try and read them! Also as Jim mentions in his review, Harvey talks of having learned a system, method or mnemonic. Where can I find it?

While doing all the above, I came across the statement that C W Ashley, G H Taber and L G Miller independently discovered the law of the common divisor. On the third or fourth reading of this, it struck me that I don't know who the latter two are, so it was back to the internet. Some trawling and an email from Des Pawson later, I think that Taber, apart from corresponding with Ashley, (privately) published a book on square Turks Heads. Does anyone have a copy? Is it good? Any mention of the law of the common divisor? A possible reprint?

Miller published the six Ashley articles that first appeared in *Sea Stories Magazine* in the book, *The Sailor and his Knots* – recently reprinted by the IGKT. But what else do we know about him and where did he write about THs? Surely some of the answers are out there! … Hello?

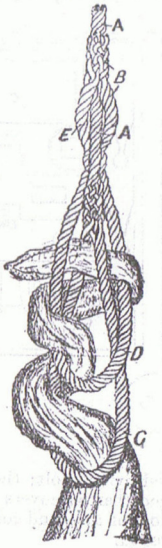
TIMES PAST

found by Richard Hopkins and Des Pawson

1887] ABRIDGMENT CLASS

1800. Hale, T. Feb. 4.

Fastenings or couplings for forming fire-escapes or for fastening various articles together. A rope is extemporized by connecting together the corners of blankets or sheets by means of this coupling - device. Each coupling consists of two cords A, B of different lengths with loops C, D at each end. The longer one A is threaded through eyes E on the shoulder B and also through its loops. The corners of the blankets are threaded in the loops as shown and become gripped when pulled tight. Attachment is made at the top to a bed post by a noose.



1878. Royal Sailor boys:
HRH Prince Albert Victor and
HRH Prince George of Wales
learning to splice
– from a photo by Messrs Downey

Thou Shalt Knot:
Clifford W. Ashley

See p 39 and
http://www.igkt.net/index.php/news

KNOTTING MATTERS!

Planning a visit? Get in touch with *KM*

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All enquries about this branch, contact the Guild's Web Administrator.

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Solent - UK

http://igkt-solent.co.uk
Contact: Chris Jenkins
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Venue: The Benjamin Perry Boathouse Phoenix Wharf, Lower Guinea Street, Bristol BS1 6TJ

Yorkshire - UK

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Venue: Scout Headquarters, Leeds

United States of America

Alaskan - USA

Contact: Charles Rigden
charles@rigdencpa.com
Tel: +(1) 1 928 231 2775
Venue: Anchorage Senior Center, 1300 East 19th Avenue, AK 99501

North American Branch - Knot in the Middle - USA

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Back Cover: Kangaroo leather-covered pen and stand by Jim Caswell (see p 40)

IGKT SALES	GBP
A Booklet on Lanyards - by Willeke van der Ham A very easy-to-follow introduction to making useful lanyards	£4.00
Design and Make Rope Mats and Rosettes - by Nils Kristian Rossing 'Recipes' for many circular mats and instructions for using a free downloadable programme to create many others	£10.00
Knotcraft - by Stuart Grainger A much-loved book about decorative knotting	£4.00
Turkshead Alternatives - by Stuart Grainger Decorative chains and grommets	£3.00
Knotted Fabrics - by Stuart Grainger Making mats, covers and baskets etc	£10.00
Decorative Woven Flat Knots (inc CD) - by Skip Pennock Lots of terrific shapes	£12.50
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Turksheads the Traditional Way - Eric Franklin A really useful introduction	£3.00
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Advanced Knotting - by Maurice McPartlan An excellent DVD with patterns for complex turksheads	£12.00
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Concerning Crosses and More - by Brian Field Flat Knots tied in hand	£3.00
Breastplate Designs - by Brian Field to make and wear	£3.00
Monographs 1 - 14 Des Pawson - Various prices see website for details	
A Comprehensive Text of Turk's Head Knots - by James Harvey - a reprint of this great book	£16.00
The Sailor and His Knots - Clifford W Ashley Reprint of the forerunner of ABOK Newly available	£10.00
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